

gaseous mixture become heavier, but it becomes cooler by the rapid volatilisation of the petroleum, and this cooling action is greater the more rapid the passage of air through the receptacle. As the absorbents may be regarded as solids, there is no danger either from the presence of loose petroleum or of explosion.

These carburetters (or, as they are termed, aero-gas fountains), in the form best adapted for lighting and heating purposes, consist of a reservoir of ordinary tin, with an air admission regulator at the top and a bent draw-off pipe at the bottom, the pipe being so designed as to syphon out the gas and prevent the possible overflow of any loose petroleum that might be left on the bottom from an overcharge. Fig. 1 is a vertical section of such a carburetter. The carburetter is divided

lifted out and a fresh one put in its place. For ships' lights, as well as in railway and other signal lights, the system offers peculiar advantages. With respect to heating, all classes of stoves can be adapted for this system.

There is one other most important branch of lighting for which the carburetter is designed, namely, lighthouses, beacons and buoys. The advantages of gas as an illuminant were early apparent to lighthouse authorities, and in the Government inquiry into the relative advantages of paraffin, gas and electricity as sources of light for lighthouse illumination, the superiority of gas was clearly pointed out, but owing to the necessity of elaborate plant needing to be installed in the vicinity of each lighthouse to be lit by gas, it was pointed out

that, despite its intrinsic advantages, it could not be recommended on account of the expense and difficulty entailed in the production. Since those days, however, the Pintsch system of vaporising oil for gas, despite its costliness both as regards the gas produced and the plant required, has been largely made use of by the lighthouse services both at home and abroad. The simple automatic carburetters that have just been described will, it is clear, place within reach of the lighthouse authorities the possibility of making use of gas-light in place of the paraffin lamps now in common use. Figs. 4 and 5 show section and elevation of a third order dioptric apparatus in which the carburetters are placed above. In place of the oil tanks required for the storing of the paraffin, the tin carburetters can be served out to the various stations ready charged, and these can be returned when exhausted and fresh ones supplied. As the absorbent takes up about three-quarters of its own volume of liquid, it is seen that the room required for storing the fountains or carburetters is little more than that needed for the present paraffin supply. As the flame given from this aero-gas is steady and constant, the trouble of maintaining the old paraffin burners of many wicks, so as to give a constant light, is obviated. By doing away with the constant level and pressure arrangements now in vogue, a considerable economy will be effected in light-house apparatus, while at the same time the risk will be lessened of a failure of some part of the mechanism.

In their application to engines for motor-cars, launches, &c., these fountains have a very wide field of usefulness, in which they offer advantages that cannot be secured without them.

J. A. PURVES.

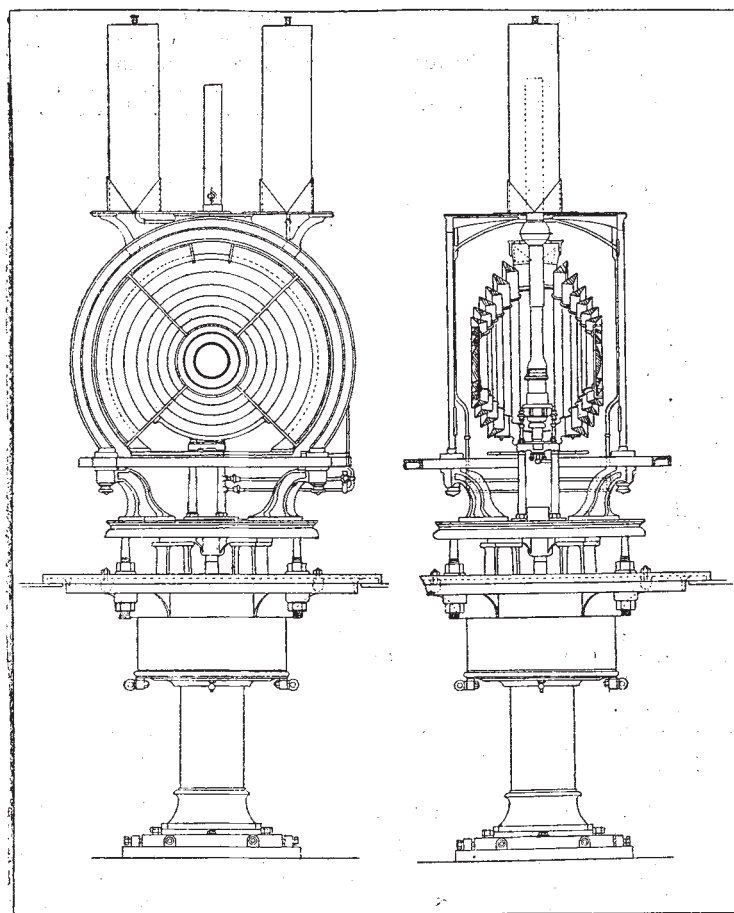


FIG. 4.

FIG. 5.

horizontally by two perforated shelves, the object of which is to produce a longer travel of the gas, and to distribute it through the perforations. Fig. 2 is a plan of the top of this fountain, while Fig. 3 is a drawing of one of the perforated shelves. The absorbent is a species of wood pulp which is entirely unaffected by the petroleum, and acts merely as a means of holding it in suspension.

With the carburetter as applied to table and other lamps, the burners used are argands, with steatite centre and very wide gas ways. The light is of high illuminating power and of remarkable purity. For street lighting the carburetter forms part of the lamp, which has a hinged top, so that when the carburetter is exhausted it can be

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NOTES.

WE regret to see the announcement of the death of Sir Henry Wentworth Dyke Acland, K.C.B., F.R.S., late Regius professor of medicine in the University of Oxford. The funeral will take place to-morrow (Friday) at Holywell Cemetery, Oxford.

PROF. T. G. BONNEY, F.R.S., has resigned the chair of geology which he has worthily occupied at University College, London, for a period of twenty-three years. The chair will become vacant at Christmas.

THE works of the late Prof. E. Beltrami (consisting of three or four large volumes) are to be issued on subscription by the Faculty of Science of the University of Rome.

A REUTER telegram from Kingston, Jamaica, states that the scientific expedition sent by Harvard University, to observe the minor planet Eros during the approaching opposition, has arrived there under the leadership of Prof. Pickering.

SIR LOWTHIAN BELL, F.R.S., has been elected president of the Institution of Junior Engineers in succession to the Hon. C. A. Parsons, F.R.S.

THE anniversary meeting of the Mineralogical Society will be held on Tuesday, November 13, at 8 p.m., when a new set of bye-laws will be recommended for adoption by the committee and council of the Society.

A REUTER telegram reports that Mr. William Zeigler, a wealthy citizen of New York, will supply the funds for an expedition to start early in 1901 under Mr. Evelyn Baldwin, in the hope of reaching the North Pole. The expedition will sail in two steamers.

AT the recent meeting in Paris the International Geodetic Association discussed the difference of longitude between Paris and Greenwich, with special reference to the discordant results obtained by the French and English astronomers in 1888 and 1892. General Bassot attributed the want of agreement to an imperfect knowledge of the constant of electrical transmission of the signals. The difference of longitude will be measured again next year.

A NEW departure, which should be of much assistance to lecturers, has been made by the Sanitary Institute. Frequent applications having been made to the Institute for the loan of lantern slides and diagrams for lecture purposes, the council have collected a large number of such slides relating to sanitary arrangements and appliances, diseases, &c., which can be borrowed by members and associates for lecture purposes at a small charge. A list of 611 slides at present available can be obtained from the secretary of the institute.

THE *Board of Trade Journal* says that information has just been received, by the Imperial Academy of Science, of the discovery of diamondiferous deposits on the Kamenka, a tributary of the Sanarka. This, it is reported, is the first time that diamonds have been discovered in this region, although the existence of such deposits in the neighbourhood of the Sanarka had already been indicated. It is stated that in structure and colour the diamonds found resemble those of Brazil.

THE annual general meeting of the London Mathematical Society will be held on November 8, at 5 30 p.m. The following nominations for the new council have been made:—Dr. Hobson, F.R.S., president. Lord Kelvin, Prof. Burnside, F.R.S., and Major MacMahon, F.R.S., vice-presidents. Other members:—J. E. Campbell, Lieut.-Colonel Cunningham, R.E., Prof. Elliott, F.R.S., Dr. Glaisher, F.R.S., Prof. M. J. M. Hill, F.R.S., A. B. Kempe, F.R.S., H. M. Macdonald, A. E. Western and E. T. Whittaker. The treasurer (Dr. Larmor, F.R.S.) and hon. secretaries (R. Tucker and Prof. Love, F.R.S.) are renominated. Lord Kelvin will probably not be able to give a valedictory address.

THE foundation stone of the Imperial "Limes" Museum, which is to be erected in the restored Roman fort of the Saalburg in the vicinity of Homburg, was laid by the German Emperor on Thursday last. The museum is to contain the Roman relics which have been discovered in the excavations in the neighbourhood of the "Limes Transrhennanus," the great Roman wall which extended from the Danube to the Rhine. The

excavations were begun in 1873, and have brought to light many objects of great interest, which have hitherto been placed in the Saalburg Museum at Homburg. They will be removed to the new museum as soon as it is completed. The Emperor sent a congratulatory telegram in Latin to Prof. Mommsen, who was unable to be present at the ceremony.

THE Philosophical Faculty of the University of Göttingen has (says *Science*) proposed the following subject for prizes on the Benecke Foundation: A critical investigation, based upon experimental research, of those complex chemical compounds which cannot be explained upon the ordinarily received theory of valence, or can be so explained only by a forced interpretation of the theory. This investigation should specially consider how far the phenomena of molecular addition play a part in the formation of these compounds and as to whether it is possible to formulate a comprehensive theory of these complex compounds. The first prize is 3400 marks and the second prize 680 marks. Papers in competition must be written in a modern language, and be accompanied by a sealed envelope containing the name, a motto on the outside of the envelope corresponding to the same motto on the paper. They should be sent to the Faculty of the University of Göttingen not later than August 30, 1902.

IN the year 1895 the Academy of Sciences of Berlin announced the following problem for the Steiner prize:—"To completely solve any important hitherto unsolved problem relating to the theory of curved surfaces, taking into account, so far as possible, the methods and principles evolved by Steiner. It is required that sufficient analytical explanations shall accompany the geometrical investigations to verify the correctness and completeness of the solution. Without wishing to limit the choice of subject, the Academy takes the opportunity to call attention to the special problems to which Steiner has referred in his general remark at the end of his second paper on maximum and minimum in figures in a plane, on a sphere, and in space." The foregoing problem having remained unsolved up to the present, the Academy again announces it for the year 1905. For its solution a prize of 4000 marks is offered, with an additional sum of 2000 marks. Papers sent in competition may be written in German, French, English, Italian, or Latin, and must be submitted before December 31, 1904, to the Bureau of the Academy, Universitäts-Strasse 8, Berlin N.W. The result will be announced at the Leibnitz meeting of 1905. Each manuscript submitted must bear a mark or *nom de plume*, and be accompanied by a sealed envelope containing the name and address of the author, and bearing outside the corresponding mark or assumed name.

THE Society for the Protection of Birds is offering two prizes, of 10*l.* and 5*l.* respectively, for the best papers on the protection of British birds. The mode of dealing with the subject is left entirely to competitors, but among the points suggested for treatment are the utilisation and enforcement of the present Acts and County Council Orders; the modification or improvement of the law; educational methods; and the best means of influencing landowners and gamekeepers, agriculturists and gardeners, collectors, bird-catchers and bird-nesters. Essays are to be sent in by November 30. Particulars may be obtained from the hon. sec., at the Society's offices, 3, Hanover Square, London, W.

DURING the last few weeks even the scientific recluse, occupied as he mostly is in the *recherche de l'absolu*, has had forced upon him, by serious and comic papers alike, the question of electioneering cries. Perhaps, however, it will be news to him that the subject of vivisection, so-called, has been pushed into the forefront of electioneering polemics. Warning was indeed given months ago that this might be the case as is evidenced

by the contents of certain letters published in Mr. Paget's book. These letters, addressed to several of Her Majesty's Ministers, threatened, in no unmistakable terms, should these officials not become anti-vivisectionists, to use against them at the next election organised opposition, which would probably prevent them being returned to Parliament by their respective constituencies. To what extent this has actually been done we have no means of knowing, but our attention has been drawn to a letter in the *North Down Herald and County Down Independent* in comparison with which the diatribes of Mr. Coleridge sink into insignificance. The interest, however, of Miss Margaret Alder's letter does not centre in its actual abuse, but in the fact that she places vivisection first among various causes which have rendered Englishmen "fit to kill, murder and rob the peaceable and pious people of South Africa." This conclusion possibly explains why during the past few months many physiologists—even those whose problems lie, for the most part, outside the field of actual animal experiments—have received daily papers and magazines in which attention has been directed by means of blue pencil to letters and articles in which the ingenuity of the pamphleteer has been used to distort the aims and results of the physiologist. Henceforth the anti-vivisectionist societies, one and all, had better be known under their true colours. They are not honest organisations sustained by conscientious thinkers, or even artistic sentimentalists, but pigmy political cliques for turning the trend of political opinion one way or another.

THE lecture session at the Imperial Institute will be opened on October 29 with a lecture entitled "The Federal Family," by Sir John A. Cockburn, K.C.M.G. This lecture is the first of a special series of eight illustrated public lectures, relating to the Australasian Colonies, to be given on Monday evenings before Christmas. The remaining lectures will be as follows:—"Golden Victoria, its scenery, geological features, and mines," by Mr. James Stirling; "Western Australia in 1900," by Mr. George Berry; "The coal resources of Victoria," by Mr. James Stirling; "The work of the Queensland weather bureau, in its relation to the natural resources and commerce of Australasia," by Mr. Clement L. Wragge; "The Australian Alps, scenery, native vegetation, and mineral wealth," by Mr. James Stirling; "New Zealand," by Mr. J. Carthart Wason; "Sunny Tasmania for English Invalids," by the Hon. Sir Philip Oakley Fysh, K.C.M.G.

AN important addition to the British Museum (Natural History) has just been made in the form of mounted specimens of two beautiful antelopes from the swamps of the White Nile, belonging to species hitherto very imperfectly represented in the collection. They are, in fact, the first complete specimens of their kind which have ever been exhibited in England. The species are *Cobus maria* and *C. leucotis*, both remarkable for their sable hue (at least in the males), relieved by white on the ears, and also the elegant and peculiar curvature of their heavily ringed horns. Of the former species the Museum possessed the heads of a male and female presented by the late Consul J. Petherick in 1859, which are in such a bad condition that they have not been exhibited to the public for several years, while the latter was best represented by a stuffed head (also the gift of the same gentleman), which is, however, so faded that its true colours are completely lost. For the new specimens (which have been set up by Rowland Ward) the Museum is indebted to Captain Dunn, now stationed, we believe, at Omdurman, by whom they were presented. Acknowledgments are, however, also due to Captain Stanley Flower, by whom the skins were brought to this country. The specimen of *C. leucotis* is exhibited in the case devoted to new acquisitions, but, on account of its larger size, the example of *C. maria* is placed

in the case in the West Corridor which will eventually form the home of both.

THE meteorological subcommittee of the Croydon Microscopical and Natural History Club has just published its report for the year 1899. It contains valuable information relating to the daily and monthly rainfall statistics for eighty stations in Kent and Surrey, together with notes relating to the temperature and weather for each month, by Dr. F. C. Bayard, the hon. sec. of the subcommittee. The observations show that the deficiency of rainfall throughout the district was about two inches. The deficit does not appear very large, but some tables showing the total departures from the average during the last ten years reveals a serious state of things. For Greenwich, for instance, the departures from the average of eighty years show a deficit of twenty-eight inches, which is practically three inches above a year's average rainfall. And again, for Surbiton, on the western side of the club's district, the departures during the same period show a deficiency of 19.5 inches, compared with an average of forty years, or a deficiency of practically only five inches below the average rainfall for a year.

THE report on the administration of the Meteorological Department of the Government of India in 1899-1900 has appeared in the same form as in previous years; the first part gives a general account of the results of the more important sections of the work of the department, and the second part gives the usual details of administration, chiefly in the form of tables. Seismological observatories have been established at three stations. The international and special cloud observations referred to in previous reports will be shortly published, with a brief discussion. The arrangements for registration of snowfall in the mountain districts and the measurement of rainfall continue to form an important part of the work of the Indian Meteorological office; monthly returns from 2300 rainfall stations were published during the year. The storm-warning work was carried out satisfactorily; ample and timely warning appears to have been given of all the more important storms. The special warnings of floods also appear to have given general satisfaction.

THE current issue of the *National Geographic Magazine* contains an article, illustrated by diagrams, on "The West Indian Hurricane of September 1-12, 1900," by Prof. E. B. Garriott, of the U.S. Weather Bureau, and another by Mr. W. J. McGee, entitled "The Lessons of Galveston." The Lessons in question are four in number, three of which are physical and one is human. The former are as follows:—1. The danger of building on sand, Galveston being founded on a sand-bank; 2. "The bank on which Galveston was built is something more than a simple heap of silicious grains and dust; it is a record of past wave work;" and "it is the duty of the nature student to interpret natural records and guard against the building on the storm records." Lesson 3 is that of coast subsidence, and, in the opinion of the author, "it is the business of the geologist to detect and weigh the evidences of subsidence or elevation of coasts, and to estimate the rates of movement for the guidance of local residents and investors, and it behoves such citizens to avail themselves of the scientific researches."

To the *Journal* of the Franklin Institute, Mr. Lewis M. Haupt, an American engineer of reputation in matters relating to river training and harbour work, contributes a paper dealing with the present condition of the navigation in the lower reach of the Mississippi, in which he advocates that the principle of reaction jetties should be applied for dealing with the contemplated improvement of the South-west Pass. The Mississippi affords an outlet into the Gulf of Mexico for 15,000 miles of navigable waterways. In the delta the main stream divides into three principal branches, and although the water is of great

depth in the channel before it enters the delta, in their natural condition these channels are so shoal as only to afford sufficient depth of water for the navigation of the smaller class of steamers. About a quarter of a century ago Captain Eads entered into a contract with the United States Government to deepen one of these passes so as to give 27 feet at low water, and to maintain this depth for a fixed period. Contrary to his strong remonstrances the South Pass, the smallest of the three outlets, was selected. Through this pass, by means of two parallel training walls, the water was confined to a width of 700 feet, and by the scour thus created, aided to a large extent by dredging, a channel having 26 feet at low water was made, and has been maintained up to the present time. This contract has now expired, and the dimensions of vessels in the meantime having outgrown the channel, the Government have had to consider the question of providing a deeper waterway. The Board of Engineers to whom the matter has been referred have advised that the South-west Pass should now be improved and deepened so as to give a depth of 35 feet at low water.

THE Board of Agriculture has published its annual report for the year 1899-1900 on the distribution of grants for agricultural education and research, with statements respecting the several colleges and institutions allied and the experiments conducted. The larger portion of the funds distributed in grants by the Board consists of subventions of a general character awarded to eight collegiate centres of agricultural education in England and Wales. Subsidiary grants have also been made to three dairy institutes, and in aid of the cost of certain specific experiments undertaken under arrangement with the Board. Examinations have also been conducted under the joint auspices of the Royal Agricultural Society and the Highland and Agricultural Society of Scotland for the recently established national diploma.

MR. HAROLD WAGER reprints from the *Journal* of the Linnean Society an interesting paper on the eye-spot in *Euglena*. He finds it to consist of a mass of pigment-granules apparently imbedded in a protoplasmic matrix. The light absorbed by the eye-spot seems to act upon a swelling near the base of the flagellum, and thus to modify its movements. *Euglena* appears, therefore, to possess a very simple form of light-organ, consisting of a sensitive region—the swelling on the flagellum—and a light-absorbing pigment-spot.

IN a note contributed to the *Renlonto* of the Naples Academy, vi. 5-7, Dr. Giuseppe de Lorenzo discusses the probable causes of the increased activity of Vesuvius at the beginning of May last. This activity assumed the form of "Strombolian" explosions audible as far away as Posilipo, by which masses of incandescent lava were hurled into the air to an altitude of about 500 metres. These explosions Dr. de Lorenzo attributes to the exceptional rainfall, which, filtering through the volcanic cone, has penetrated to the column of lava. This hypothesis appears in conformity with the observations of Spallanzani, von Rath, Dana and others, and with the experimental researches of Daubree.

TWO papers on the figure of the earth have recently appeared, one, by M. Marcel Brillouin, in the *Revue générale des Sciences*, xiv., and the other, by Ingeguere Ottavio Zanotti Bianco, in the *Atti* of the Royal Academy of Turin, xxxi. M. Brillouin discusses the different geoidic surfaces adopted in the problem of reduction to sea level, and points out the relative advantages of the geoids of Pratt and Helmert. Bianco's paper contains extracts from the writings of Pratt and Helmert, showing the relative part played by these investigators and by Bruns in developing the general theory of geoidic surfaces.

THE Selborne Society's magazine, *Nature Notes*, contains in its September issue an interesting account of a mirage, seen last June over the Needles (Isle of Wight) from the opposite shore,

by Captain Giles A. Daubeny. It is not uncommon when looking at a distant headland to see the appearance of a pointed nose jutting out over the water—an effect caused by the formation of an inverted image near the water-line; but in the present instance four different horizons appear to have been observed when viewing the rocks through a telescope.

THE admirable series of memoirs published by the U.S. Department of Agriculture on the harmfulness or otherwise to the agriculturist and horticulturist of the commoner birds of North America has recently been augmented by one from the pen of Mr. F. E. L. Beal, dealing with the food of the bobolink, black-birds and grackles. This memoir forms *Bulletin* No. 13 of the Department. The bobolink is an exception to most birds in that, both at seed-time and harvest, it inflicts immense damage on the rice-crops of the Southern States. At present, therefore, the harm it does far outweighs such benefits as it may confer; but as the bird could exist perfectly well without touching a grain of rice, hopes are entertained that means may be found of checking its depredations on that crop. On the other hand, most or all of the so-called blackbirds (which are not to be confounded with the species of the same name in Europe) feed largely upon noxious insects and weed-seeds, and are therefore highly beneficial to the cultivator. Much the same may be said of the grackles. As usual, the *Bulletin* is illustrated with good figures of the species described, and the whole publication does the greatest credit to the Government by whom it is issued.

Bulletin No 67 of the West Virginia University Experiment Station is devoted to a communication by Dr. A. D. Hopkins on the Hessian fly in West Virginia, and how to prevent losses by its ravages. As the result of his investigations, the author finds that the date of the appearance of the swarms of this insect depends upon the latitude and altitude of the place, and he gives a formula by means of which the former may be approximately determined for any particular locality. From this the dates may be calculated at which it is reasonably safe to sow wheat in order to escape loss from the ravages of the pest. The approximate limits of the best wheat-sowing period, and also the approximate normals for the disappearance of the fly in different districts, are graphically illustrated by means of a map.

THE September issue of the *American Naturalist* commences with an interesting paper, by Miss (or ? Mrs.) Sampson, on unusual modes of development among frogs and toads. Commencing with a *résumé* of the normal mode of breeding as exemplified in the common frog, the author goes on to show how different members of the group depart from this mode of procedure. Two species, for example, the one from West Africa and the other from Brazil, deposit their spawn in nests formed of leaves stuck together, the tadpoles moving in a mass of froth, recalling that of the cuckoo-spit insect. In both these instances the spawn is deposited in the neighbourhood of water, into which the tadpoles ultimately fall; but in a tree-frog from Rio, in which the eggs are likewise hatched in a frothy mass among leaves, the larvæ actually die if they are put into water. In another Brazilian tree-frog the tadpoles frequent cracks in rocks, and adhere to the surfaces of the latter by means of an abdominal sucker. Full reference is made to the mode of development in the Surinam toad, and also to that of the marsupial frogs, in which the young are hatched in a dorsal pouch. But perhaps the most extraordinary "nursery" arrangements in the entire group are those of the Chilean Rhinoderma, in which the tadpoles undergo their development in an enormous pouch on the throat of the male. In the same journal Mr. F. Russell has a paper on cranial abnormalities in the American races, among some of whom the persistence of the frontal suture may occur as frequently as 2.9 per cent.

THE October issue of the *Entomologist* contains a summary of the capture of rare British insects during the past summer and autumn. In addition to the swarms of the pale clouded yellow butterfly (*Colias hyale*), to which allusion has been already made, no less than ten examples of the Camberwell beauty (*Vanessa antiopa*) are recorded as having been taken in the south-east and east of England. Caterpillars of the death's-head moth (*Acherontia atropos*) have been extraordinarily abundant in potato crops during the season, and many other rarities are recorded.

THE *Bulletin* of the American Mathematical Society for October contains a useful list of courses in mathematics announced by seventeen German universities for the 1900-1901 session.

THE Department of Mines, Victoria, has issued No. 7 of the Reports of the Victorian Coal-fields, by Mr. James Stirling, the Government geologist. It consists of descriptions, with illustrations, of the fossil flora of the Jurassic beds of South Gippsland.

A SIMPLE description of the movements and obvious characteristics of the members of the solar system, and other celestial bodies, is given in Mr. W. T. Lynn's "Astronomy for the Young" (pp. 51), the second edition of which has just been published by Mr. G. Stoneman, London, E.C.

THE lecture syllabus of the Hull Scientific and Field Naturalists' Club for the winter session ranging from October to March has just reached us, and gives promise of a full and interesting winter's work. Judging by the contents of the *Transactions* of the Club for 1900, a copy of which has also been sent to us, the institution is in a healthy and vigorous condition.

COUNTY floras have at present been pretty much confined to flowering plants and fern allies. We welcome the precedent set by the Yorkshire Naturalists' Union in issuing an Alga-Flora of Yorkshire, being a complete account of the known freshwater algae of the county, by Mr. W. West and Mr. G. S. West. The present publication, which is only a first instalment, includes 208 species.

THE October number of the *Contemporary Review* contains two articles of scientific interest, one, by Prof. Marcus Hartog, on "Interpolation in Memory," and one by Mr. A. Shadwell, entitled "The true aim of Preventive Medicine." The current issue of the *Humanitarian* has in it a very readable contribution on "Heredity as a Factor in the Interpretation of Disease," from the pen of Prof. D. J. Hamilton of Aberdeen.

A PROOF of old Semitic influence in South Africa is afforded, according to K. Meinhof (*Globus*, Band lxxviii. p. 203), by the occurrence of the word "darama" or "ndalama" in various Bantu dialects for "gold." An ancient Arabic word for gold was "dirhem," pl. "darāhim." According to the phonetic system of the Bantu languages this would necessarily be transformed into "ndalama."

MR. C. FOX-STRANGWAYS contributes some interesting notes on Spitsbergen and Iceland in the *Transactions* of the Leicester Philosophical Society for April, 1900. Having spent only a short time on these islands, the author does not claim to record much that is new regarding them, and his article is written chiefly in explanation of a series of photographs which are reproduced to accompany the notes.

THE additions to the Zoological Society's Gardens during the past week include a Brown Capuchin (*Cebus fatuellus*) from Guiana, presented by Mrs. W. L. Gower; two Yellow-whiskered Lemurs (*Lemur xanthomystax*) from Madagascar, presented by Mr. J. B. Joel; a Common Genet (*Genetta vulgaris*), European, presented by Baron de Soutellinlio; an Alligator (*Alligator*

mississippiensis) from North America, presented by Mrs. Bazalgette; a Porose Crocodile (*Crocodilus porosus*) from the East Indies, presented by Miss Gwendoline Waite; a Broad-nosed Lemur (*Haplemur simus*) from Madagascar, four Indian Fruit Bats (*Pteropus medius*), six Starred Tortoises (*Testudo elegans*) from India, a Dusky Sloth (*Bradypus infulcatus*) from Colombia, an Illiger's Macaw (*Ara maracana*) from Brazil, two Salvin's Amazons (*Chrysotis salvini*), an Annulated Terrapin (*Nicoria annulata*), a Brazilian Tortoise (*Testudo tabulata*), an Electric Eel (*Gymnotis electricus*) from South America, four Wrinkled Terrapins (*Cyclemmys scripta rugosus*) from the West Indies, a Common Water-Buck (*Cobus ellipsiprymnus*) from South Africa, deposited; a Violaceous Night Heron (*Nycticorax violaceus*) from South America, purchased.

OUR ASTRONOMICAL COLUMN.

EPHEMERIS FOR OBSERVATIONS OF EROS:—

1900.		R.A.		Decl.
		h. m. s.		
Oct. 18	...	2 36 36.00	...	+50° 47' 13".4
19	...	35 30'95	...	51 4 38'.6
20	...	34 21'37	...	51 21 32'.0
21	...	33 7'26	...	51 37 51'.5
22	...	31 48'74	...	51 53 35'.1
23	...	30 25'82	...	52 8 41'.0
24	...	28 58'65	...	52 23 7'.4
25	...	2 27 27'35	...	+52 36 52'.0

NEW PLANETARY NEBULA.—Mr. R. G. Aitken writes to the *Astronomische Nachrichten* (Bd. 153, No 3667) announcing that the object catalogued as star BD + 83° 35' is a small planetary nebula. With the 36 inch Lick telescope the object appears to have a stellar nucleus of about 10.5-11 magnitude centrally placed in a circular nebulous envelope about 5"-6" of arc in diameter. The complete object is about 9.5 magnitude, and its position is:—

$$\left. \begin{array}{l} \text{R.A.} \quad 12 \quad 29 \quad 10 \\ \text{Decl.} + 83^{\circ} \quad 21' \quad 8'' \end{array} \right\} (1855^{\circ} 0).$$

PARIS OBSERVATORY, ANNUAL REPORT.—In his report of the work accomplished at the Paris Observatory during the year 1899, M. Loewy, the director, states that a considerable part of the time was spent in preparing for the Exposition. Special photographs on a large scale were taken of the moon about the time of first and last quarter, giving an image about 1.38m. in diameter; considerable difficulty was encountered in the preparation of the plates for these, and special mention is made of the services rendered by MM. Lumière in this matter. Among the new instruments adopted are (a) the mercury bath designed by M. Hamy for registering earth tremors, (b) a new micrometer by Gautier for measuring the chart plates, (c) a new form of chronograph designed by M. l'Abbé Verschaffel, director of the Abbadia Observatory. This latter has been introduced for use in the proposed new determination of the difference in longitude between Paris and Greenwich.

For the chart photographs ninety-six sheets have been issued, and the first part of the catalogue, giving the exact positions of stars down to the eleventh magnitude, will be issued during the present year. An investigation is in progress for determining more accurately the photographic magnitudes of stars. Valuable help has been given by M. l'Abbé Verschaffel, of Abbadia, who has determined the coordinates of 3700 fundamental stars of reference for the chart photographs. A fourth volume of the "Atlas de la Lune," containing seven plates, has been published, accompanied by a descriptive memoir.

M. Bigourdan has continued his study of the nebulae, having now measured the positions and made detailed study of 6000 of them; to complete his programme of work 400 more still remain to be examined.

The small equatorial Coudé, which was the first instrument of this type, has been entirely remodelled. A new objective has been made by MM. Henry, of longer focus than the old one (5.25 metres instead of 4.22), the silvered mirrors protected more from the action of atmospheric gases, and the whole instrument encased in a thick layer of felt. These modifications have removed all the defects existing in the old telescope.